



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,761	04/19/2006	Didier Letourneur	RN03086	5139
7590 Jean Louis Seugnet Rhodia Inc CN 7500 259 Prospect Plains Road Cranbury, NJ 08512-7500			EXAMINER DAVIS, BRIAN J	
			ART UNIT 1621	PAPER NUMBER
			MAIL DATE 06/06/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,761	LETOURNEUR ET AL.	
	Examiner	Art Unit	
	Brian J. Davis	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over any of *Applied Catalysis, A: General* (1995), 133(2), p. 367-376 (CAPLUS abstract), WO 2000027526 (CAPLUS abstract), or WO 2000027525 (CAPLUS abstract).

Applicant claims a process for the purification of aliphatic diamines (e.g. hexamethylene diamine) by hydrogenation in the presence of a Pt, Pd, Ru, Rh, Ir, Ni or Co catalyst (claim 11). The dependent claims further define the process.

Applied Catalysis, A: General (1995), 133(2), p. 367-376 teaches the catalytic hydrogenation of adiponitrile to hexamethylene diamine using Ni, Co, Ru, NiCr, NiTi, NiCo and CoFe Ziegler-type catalysts.

WO 2000027526 and WO 2000027525 teach the catalytic hydrogenation of adiponitrile to 6-aminocapronitrile and hexamethylene diamine using Fe, Co and a third metal selected from Ni, Rh, Ru, Pd, Pt, Os and Ir.

The specification explicitly states that the preferred embodiment of the invention is to hydrogenate the amine in the reaction medium from which it was synthesized (page 2, line 9). Dependent claims 15, 16, 21, 22 also explicitly refer to this embodiment.

During patent examination, the pending claims must be given their broadest reasonable interpretation consistent with the specification. *In re Hyatt*, 211 F. 3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). In the instant case, that interpretation is that applicant is simply claiming the synthesis of aliphatic amines by the catalytic hydrogenation of the corresponding nitriles using a set of catalytic metals, since the product amines are never separated from the reaction medium, the hydrogenation of

the nitriles is per force also the hydrogenation of the product amines. The cited references are representative examples of an extensive literature drawn to the old and well-known synthesis of aliphatic diamines from the corresponding nitriles by catalytic hydrogenation using catalysts containing Pt, Pd, Ru, Rh, Ir, Ni or Co.

Applicant distinguishes over the prior art only in the wording of the independent claim. That is applicant claims a purification, but then as a reasonable interpretation of the claim in light of the specification makes clear, one embodiment of this "purification" may simply be the old and well-known nitrile hydrogenation reaction. The examiner respectfully reminds applicant that while an applicant may be his own lexicographer, applicant may not distort art-recognized terms. *Ex parte Klager*, 132 USPQ 203 (POBA 1959).

The remaining dependent claims are included in this rejection as they represent - absent unexpected results - mere engineering expediciencies.

Claims 11-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,523,973 in view of US 4,766,247; US 5,362,914; and US 5,364,971.

Applicant claims a process for the purification of aliphatic diamines (e.g. hexamethylene diamine) by hydrogenation in the presence of a Pt, Pd, Ru, Rh, Ir, Ni or Co catalyst (claim 11). The dependent claims further define the process.

US 3,523,973 teaches that bis-hexamethylene triamine is an impurity produced in the synthesis of hexamethylene diamine from the catalytic hydrogenation of adiponitrile. This byproduct is removed from the crude hexamethylene diamine product and

Art Unit: 1621

subjected to hydrogenation under identical conditions (“...adiponitrile hydrogenation conditions...”) to yield additional hexamethylene diamine (column 2, line 23).

US 4,766,247 teaches that polyethylene polyamines or polyalkylene polyamines may be purified (i.e. have their color reduced) by mild hydrogenation in the presence of hydrogenation catalysts (column 2, line 41).

US 5,362,914 teaches that polyethylene polyamines, polyalkylene polyamines, or perhaps polyamines in general, may be purified (i.e. have their color reduced or eliminated) by mild hydrogenation with a Co catalyst promoted with Cu and Cr on alumina (column 2, line 54).

US 5,364,971 teaches that polyethylene polyamines, polyalkylene polyamines, or perhaps polyamines in general, may be purified (i.e. have their color reduced or eliminated) by mild hydrogenation with a Ru catalyst on alumina (column 2, line 52).

Applicant principally distinguishes over the prior art in that a specific set of starting amines to be purified (aliphatic diamines) is claimed. However, as US 4,766,247; US 5,362,914; and US 5,365,971 make clear, it is well known in the art that aliphatic polyamines may be purified by mild hydrogenation using well known hydrogenation catalysts. And more narrowly, US 3,523,973 teaches that it is known that a polyalkylene polyamine impurity (bis-hexamethylene triamine) from the catalytic hydrogenation of adiponitrile to yield hexamethylene diamine may be further hydrogenated under identical conditions to yield hexamethylene diamine. It, therefore, would have been obvious to one of ordinary skill in the art at the time of the invention to

Art Unit: 1621

purify aliphatic diamines by catalytic hydrogenation given the teachings of the prior art and motivated by the desire to improve both yield and quality.

The dependent claims are included in this rejection as they represent
- absent unexpected results - mere engineering expediencies.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 6,291,715 B1 is cited to show a hydrogenation of alkanolamines (which are closely structurally related to the compounds of the instant invention) as a means of purification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Davis whose telephone number is 571-272-0638. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph K. McKane can be reached at 571-272-0699. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

 **BRIAN DAVIS**
PRIMARY EXAMINER
Brian J. Davis
May 29, 2007